

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Irving et al.)
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SERIAL NO.: 10/600,302) Examiner: R. Rabago
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FILED: June 20, 2003) Art Unit: 1713
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TITLED: LOW SEDIMENT PROCESS FOR)
 THERMALLY REACTING HIGHLY)
 REACTIVE POLYMERS AND)
 ENOPHILES)
)

Atty. Docket No. 2003L003

Assistant Commissioner for Patents
Washington, DC 20231

DECLARATION UNDER 37 CFR SECTION 1.132

I, Jacob I. Emert, Ph.D., hereby declare and say as follows:

1. I was awarded a BS degree in Chemistry from Brooklyn College in 1970 and was awarded a Ph.D. in Organic Chemistry from Columbia University in 1974. From 1974 through 1981, I was employed as an Assistant Professor of Chemistry by Polytechnic Institute of New York. From 1981 to 1999, I was employed by Exxon Chemical Company, and from 1999 to the present, I have been employed by the successor in interest to the lubricating oil additives business of Exxon Chemical Company; Infineum USA L.P. where my present title is Chief Scientist. During my period of employment with Exxon Chemical Company and Infineum USA L.P., I have been engaged continuously in the research and development of lubricating oil additives and compositions. I am a named co-inventor of the subject matter of the above-identified patent application.

2. The above-reference application was rejected in view of the disclosure of U.S. Patent No. 4,086,251 to Cengel et al. (hereinafter "the Cengel et al. patent"). It was noted that the Cengel et al. patent describes the ene reaction of an olefin polymer and maleic anhydride in the presence of "a tar and side product suppressing additive", certain of which would act as the "free radical inhibitor" of the present invention. The olefin polymer of the Cengel et al. patent is described as a polybutene which is formed by polymerization in the presence of a Friedel-Crafts catalyst

(AlCl₃). It is noted that such polymers are "largely monoolefin" with the unsaturation being "predominantly in a terminal or near terminal group", which group is "of the trisubstituted or vinylidene type". It is alleged that the polymers of the Cengel et al. patent would therefore inherently have a terminal vinylidene content of at least 30%. This declaration is being provided to demonstrate that the polymers of the Cengel et al. patent would not inherently have the vinylidene content required by the claims of the present application and that, in fact, one skilled in the art would consider it unlikely that polymers formed in the presence of a Friedel-Crafts catalyst would have a terminal vinylidene content approaching the requisite 30% minimum.

3. Carbon-13 NMR Spectra for polyisobutylene (2225 mw) polymerized in the presence of Friedel-Crafts catalysts are shown in the attached Attachments A2 (AlCl₃ catalyst) and B2 (EADC (ethyl aluminum dichloride) catalyst). Carbon-13 NMR data derived from these spectra are provided in Attachments A1 and B1, respectively. As is clearly shown by the data, olefin polymer that results from polymerization in the presence of Friedel-Crafts catalysts may be (a) "largely monoolefin"; (b) with the unsaturation being "predominantly in a terminal or near terminal group"; (c) which group is "of the trisubstituted or vinylidene type", without having a substantial terminal vinylidene content. As shown, the olefin analyses of Attachments A1 and A2 indicate terminal vinylidene contents of only 5.6 % and 7.0 %, respectively. Thus, it is apparent that the polymers of the Cengel et al. patent do not inherently (and in fact do not) have a terminal vinylidene content of at least 30%.

It is declared by the undersigned that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: January 29, 2007 Signed: Jacob J. Emert
Jacob J. Emert Ph.D.

Attachment A1

Poly-isobutylene olefin analysis (Carbon-13 NMR Data) for

2225 MW poly-isobutylene polymerized in the presence of AlCl₃ Catalyst

Raw Integral Values:

region	integral (mm)
1	1.2
2	4.6
3	9.4
4+5	4.1
6	0.1
7	3.3
8	4.0
9	7.5
10	20.5
11	18.5
14	4.0
12+13	4.7
8	1.3
7	3.7
10	20.8
9	11.0
11	16.2
2	3.1
1	0.0

Olefins type Distribution:

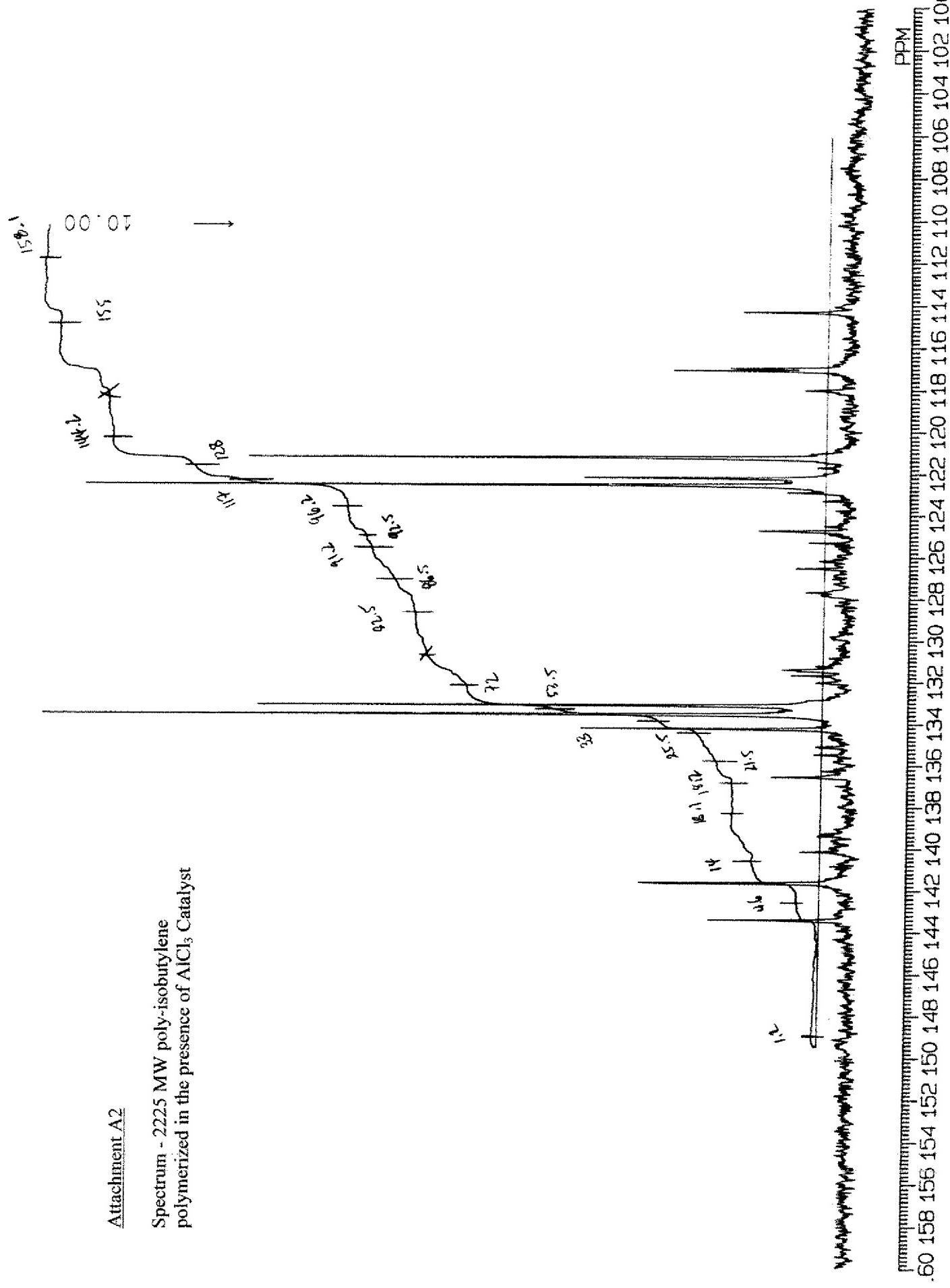
olefin	integral	percent
1	0.60	0.7
2	3.85	4.8
3	9.40	11.7
4+5	4.10	5.1
6	0.10	0.1
7	3.50	4.4
8	2.65	3.3
9	9.25	11.5
10	20.65	25.8
11	17.35	21.6
12+13	4.70	5.9
14	4.00	5.0

80.15

Olefin Substitution Distribution	Percent
Vinylidene	5.6
Trisubstituted	57.6
Tetrasubstituted	36.9

Attachment A2

Spectrum - 2225 MW poly-isobutylene
polymerized in the presence of AlCl_3 Catalyst



Attachment B1

Poly-isobutylene olefin analysis (Carbon-13 NMR Data) for

2225MW poly-isobutylene polymerized in the presence of EADC (ethyl aluminum dichloride)
Catalyst

Raw Integral Values:

region	integral (mm)
1	2.1
2	3.9
3	6.5
4+5	4.6
6	1.4
7	3.2
8	3.9
9	7.4
10	18.4
11	16.7
14	5.5
12+13	3.0
8	2.0
7	3.1
10	17.2
9	11.9
11	13.2
2	3.4
1	1.0

Olefins type Distribution:

olefin	integral	percent
1	1.55	2.1
2	3.65	4.9
3	6.50	8.7
4+5	4.60	6.2
6	1.40	1.9
7	3.15	4.2
8	2.95	3.9
9	9.65	12.9
10	17.80	23.8
11	14.95	20.0
12+13	3.00	4.0
14	5.50	7.4
	74.70	

Olefin Substitution Distribution	Percent
Vinylidene	7.0
Trisubstituted	57.4
Tetrasubstituted	35.6

Attachment B2

Spectrum - 2225 MW poly-isobutylene polymerized in the presence of EADC Catalyst

